

# Patient's Experiences and Satisfaction in Diabetes Care and Out-of-Pocket Expenditure for Follow-Up Care Among Diabetes Patients in Urban Puducherry, South India

Journal of Patient Experience  
2020, Vol. 7(6) 1445-1449  
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DOI: 10.1177/2374373519898919  
journals.sagepub.com/home/jpx  


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## Abstract

**Introduction:** Type 2 diabetes mellitus has huge economic burden for both patient and health-care system. Management of the condition in India faces multiple challenges such as paucity of trained medical and paramedical staff, poor quality, lack of satisfaction with services, and unaffordability of services. **Objective:** To determine the level of satisfaction and the out-of-pocket expenditure for type 2 diabetes patients receiving treatment from public and private sectors in urban Puducherry. **Methods:** This was a cross-sectional analytical study conducted in Urban Health Centre area of tertiary care center from August to September 2016. A total of 200 patients suffering from type 2 diabetes mellitus for 1 year or more and resided for at least a year in Puducherry were included in the study. Among the 200 participants, 100 were receiving care from government and 100 from private facility. **Result and conclusion:** Median cost of diabetes care in government facility was 2000 INR while in private facility was 13050 INR. About 70.1% of the patients were satisfied with the health-care services received. There was no significant difference in the level of satisfaction between government and private health facility. Almost three-fourths of the diabetes patients are satisfied with the care received irrespective of the type of health facility. The cost of diabetes care is more for patients seeking care from private sector than public sector. Availability of insulin and free syringes in the primary health center, provision of specialized footwear, and spectacles free of cost can help in reducing the out-of-pocket expenditure.

## Keywords

diabetes mellitus, health expenditures, patient satisfaction, private sector

## Introduction

Type 2 diabetes mellitus is emerging as an epidemic and its treatment is a huge economic burden both for the patient and for the health-care system. Management of this disease in India faces multiple challenges, such as low levels of awareness, paucity of trained medical and paramedical staff, patient satisfaction with health-care facility, and unaffordability of medications and services (1). Patient's satisfaction depends upon the quality of health-care services provided. Previous research in India have shown that although people have better trust in public sector compared to private sector, some people seek private sector for vaccination as they perceived higher competence when compared to public sector (2). Use of private sector services can increase the out-of-

pocket expenditure leading to more economic burden on the families. The term out-of-pocket expenditure is the share of the expenses the individual must pay directly to the health-care provider, without a third party (insurer or government) (3). People hailing from middle and low socioeconomic backgrounds suffer considerable financial strain and have

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more complications, and the age of disease detection is higher due to less health-seeking behavior and inability to pay for the medical care (4).

India had 61.3 million patients with type 2 diabetes mellitus in 2011, which is predicted to increase to 101.2 million by 2030 (5). In Indian scenario, the total annual expenditure on diabetes care is 10 000 INR in urban and 6260 INR in rural areas (6). In a low-income family residing in an urban locality, an adult diabetes patient spends approximately 34% from his family income (6). People suffering from type 2 diabetes mellitus are more prone to develop cardiovascular disease, obesity, hypertension, and dyslipidemia, which increase the cost of treatment further (7).

High out-of-pocket costs correlate with lower therapy compliance leading to poor prognosis (8). Limited studies are available regarding the patient satisfaction and out-of-pocket expenses for the diabetic care in India. This study can provide useful information regarding 2 of 3 goals of universal health coverage: quality of care and financial protection among diabetes patients. By assessing the health-care costs, this study leads strategies aimed at reducing out-of-pocket expenditure for diabetic care of patients suffering from type 2 diabetes mellitus and improves the level of satisfaction after obtaining treatment. Hence, this study aims at finding the cost due to diabetes care including treatment on outpatient basis, medicines, lab and radiological cost, and transportation and diet costs incurred in the last 1 year and also determines the level of satisfaction with the current therapy of the patients by asking them to rate their satisfaction levels.

## Materials and Methods

### Study Setting and Period

A community-based cross-sectional analytical study was carried out among diabetes patients residing in the JIPMER Urban Health Centre (JIUHC) service area, Puducherry. JIPMER Urban Health Centre caters to a population of around 10 000 spread over 4 villages, namely Kuruchikuppam, Vaithikuppam, Vazhaikulam, and Chinnayapuram. Study was conducted during the months of August and September 2016. The protocol was approved by JIPMER Scientific Advisory Committee and Indian Council of Medical Research and then approved by the Institute Ethics Committee (human studies) on July 13, 2016, before starting the study.

### Sample Size and Sampling Technique

Approximately 600 diabetes patients were present in these regions according to the JIUHC annual survey report 2016, and the address list of diabetes patients was retrieved from it. There were 270 patients receiving treatment from government facility and 330 patients receiving treatment from private health facilities. People who were suffering from type 2 diabetes mellitus for 1 year or more and above 18 years of age and residing for at least a year in Puducherry were

included in the study. Patients of type 1 diabetes mellitus and women having gestational diabetes mellitus are excluded. In total, 200 diabetes patients were selected, with 100 receiving treatment from government facility and 100 from private facility. Participants were selected using convenience sampling method.

### Data Collection and Study Procedure

Six training doctors posted in urban health center were chosen as data collectors. They were sensitized regarding the objectives of the study, confidentiality of information, participant's right, and informed consent and were also trained to administer the questionnaire to the individuals. Postgraduates posted in the same urban health center supervised the data collection procedure by reviewing all questionnaires at the end of each day to ensure completion of data collection forms as well as addressed any issue faced by the data collectors.

The purpose of the study and procedure involved in the study was explained to the individuals before administration of the questionnaire. Individuals were also assured regarding confidentiality of the information, and data collection was started after obtaining informed consent. Questionnaire consisted of 3 sections: first section collected information on sociodemographic variables using pretested semi-structured questionnaire; second section collected information on out-of-pocket expenditure of the patients (both direct medical and nonmedical costs) including diet cost, transportation cost, medication cost, imaging cost, and surgical cost; third section consisted of information on the level of satisfaction with the current therapy of the patients by asking them to rate the satisfaction levels using a 5-point Likert scale, 1 being very satisfied and 5 being very dissatisfied.

### Statistical Analysis

Data were entered into Microsoft Excel software (2010) and analysis was done using SPSS version 19.0. Continuous variables such as age were summarized as mean (standard deviation [SD]). Out-of-pocket expenditure of the patients was summarized as median with interquartile range (IQR). Chi-square test was used to determine the association between the sociodemographic variables and level of satisfaction of diabetes patients with health-care services provided.  $P$  value  $<.05$  is considered as statistically significant. Mann-Whitney  $U$  test was used to test the significance of cost differences between public and private sectors for diabetes care.

## Results

In total, 200 patients with diabetes mellitus, with 100 receiving treatment from government facility and 100 from private health facility, participated in the study. Mean (SD) age of the study participants receiving treatment from government facility was 59.3 (11.3) years and from private facility was

**Table 1.** Sociodemographic Characteristics of the Study Participants.<sup>a</sup>

Sociodemographic Characteristics	Frequency, n (%)
Age category (in years)	
≤60	122 (61.0)
>60	78 (39.0)
Gender	
Male	78 (39.0)
Female	122 (61.0)
Education	
Illiterate	53 (26.5)
Primary school certificate	60 (30.0)
Middle school certificate	53 (26.5)
High school certificate	18 (9.0)
Intermediate or post high school diploma	8 (4.0)
Graduate or postgraduate	8 (4.0)
Occupation	
Employed	81 (40.5)
Housewife	80 (40.0)
Unemployed	39 (19.5)
Religion	
Hindu	170 (85.0)
Christian	28 (14.0)
Muslim	2 (1.0)
Family history of diabetes mellitus	
Present	63 (31.5)
Absent	137 (68.5)

<sup>a</sup>N = 200.**Table 2.** Details of Complications Suffered by Study Participants Due to Diabetes Mellitus in the Past 1 Year.<sup>a</sup>

Patient Characteristics	Frequency, n (%)
Complications	
Absent	141 (70.5)
Present	59 (29.5)
Retinal complications	20 (10.0)
Hyperglycemia	11 (5.5)
Foot complications	8 (4.0)
Cardiovascular complications	7 (3.5)
Hypoglycemia	6 (3.0)
Renal complications	5 (2.5)
Dental complications	2 (1.0)
Hospitalization	
Absent	154 (77.0)
Present	46 (23.0)
Surgery	
Undergone surgery for complication	20 (10.0)
Did not undergo any surgery	180 (90.0)

<sup>a</sup>N = 200.

57.4 (12.2) years. Majority (68%) were females; about 85% belonged to Hindu religion; more than one-fourth (26.5%) had no formal education; about 40.5% were employed; less than one-third (31.5%) of the patients had family history of diabetes mellitus as described in Table 1.

Table 2 depicts the details of complications suffered by study participants due to diabetes mellitus in the past 1 year.

Almost one-third (30%) of the study participants had some complications. Diabetic retinopathy (10%) is the most common complication. Around 23% were hospitalized in the past 1 year for diabetes-related complications. Almost 10% had surgical intervention for diabetes-related complications.

Details of out-of-pocket expenditure of the patients are described in Table 3. The median of total cost of diabetes care for government facility was 2000 INR with IQR of 1500 and for private health facility was 13 050 INR with IQR of 5450. In government health facility, almost all the costs are related to direct nonmedical costs like diet and transportation cost, while in private facility, direct medical costs such as medication costs followed by diagnostic costs are the major contributor for out-of-pocket expenditure of the patients. Cost of treatment differed significantly based on type of health facility, that is, care in private facility lead to higher out-of-pocket expenditure when compared to government facility and it was statistically significant ( $P < .001$ ).

About 70.5% of the study participants were satisfied with the health-care services provided for the care of diabetes mellitus. Table 4 shows the association of sociodemographic variables with the level of satisfaction of patients with diabetes care services. Patients who did not have hospitalization had significantly higher chance of being satisfied with health-care services when compared to patients who had hospitalization ( $P = .003$ ). Patients who do not have any complications had higher chance of being satisfied with health-care services when compared to patients who have complications, and it was statistically significant ( $P = .02$ ). Patient satisfaction did not differ significantly with age, gender, and type of health facility.

## Discussion

This was a cross-sectional analytical study conducted among diabetes patients to determine the level of satisfaction and out-of-pocket expenditure associated with care received from government and private health facility for diabetes care. The median of total cost of diabetes care for government facility was 2000 INR with majority contributed by diet and transportation costs. Out-of-pocket expenditure found in the current study for private health facility (13 050 INR) is almost similar to the previous study findings which showed that the average cost annually per diabetes patient availing treatment in a private hospital in south India was around 15 000 INR (9). Another study from Delhi reported that more than half of the average annual direct cost of type 2 diabetes was medication-related costs (10), which is also similar to the current study finding.

Current study found that almost three-fourths (70.5%) was satisfied with diabetes care provided irrespective of the public or private health facility. Similar findings were found in the study done in Saudi Arabia (63%) (11) and Nigeria (84%) (12), where more number of patients was satisfied with the diabetes care. However, contrast findings were found in studies done in Mexico (13) and Sudan (14), where

**Table 3.** Out-of-Pocket Expenditure of Patients Receiving Diabetes Care in INR.<sup>a</sup>

Cost	Facility	Median (INR)	Interquartile Range (INR)	P Value
Medicines cost	Government	0.00	0	<.001
	Private	10 400.00	4225	
Laboratory cost	Government	0.00	0	<.001
	Private	600	500	
Surgery cost	Government	0.00	75	.579
	Private	0.00	875	
Transportation cost	Government	100.00	500	.000
	Private	500.00	200	
Diet cost	Government	1000.00	1000	.021
	Private	1000.00	1000	
Total cost	Government	2000.00	1500	.000
	Private	13 050.00	5450	

<sup>a</sup>N = 200.**Table 4.** Association of Sociodemographic Variables With the Level of Satisfaction of Patients With Diabetes Care Services.<sup>a</sup>

Patient Characteristics	n	Patients Highly Satisfied (n = 141)	P Value
Age category (in years)			
≤60	122	84 (68.8)	.30
>60	78	57 (73.1)	
Gender			
Male	78	53 (67.9)	.81
Female	122	88 (72.1)	
Type of health facility			
Government	100	72 (72)	.78
Private	100	69 (69)	
Complications			
Absent	141	106 (75.2)	.02 <sup>b</sup>
Present	59	35 (59.3)	
Hospitalization			
Absent	154	117 (76.0)	.003 <sup>b</sup>
Present	46	24 (52.2)	

<sup>a</sup>N = 200.<sup>b</sup>P value statistically significant.

only one-fourth to one-third of patients were satisfied with the care provided for diabetes mellitus. This can be attributed to the type of health facility in which the patient satisfaction was assessed in Mexico and Sudan studies as it was conducted in primary health-care facility. While other studies including the current one had more number of patients receiving care from secondary and tertiary care facility.

The current study also found that patient who had complications and hospitalized had poor satisfaction with care provided when compared to the patients who did not have any complications or hospitalization. This shows that the health facilities are better equipped to handle outpatient care of the diabetes patients when compared to inpatient care for complications related to diabetes mellitus in both public and private health facilities.

Major strength of the study is the collection of details in relation to both quality of diabetes care assessed through the

level of satisfaction of the patients and financial protection of diabetes patients assessed via the out-of-pocket expenditure incurred in both public and private facilities. The current study adds to the limited literature available regarding the assessment of diabetes care in South Indian health-care settings. However, the study has certain limitations. Since we followed convenience sampling method, the sample may not be representative of the study population, which limits the generalizability of the study results. Since this was a cross-sectional survey, causality of association cannot be determined.

The cost of diabetes care is more for patients seeking care from private facility compared to government facility. Strategies aimed at reducing out-of-pocket expenditure need to be developed. Patients approach tertiary health-care facility for insulin vials leading to raised direct nonmedical costs such as transportation costs. Hence, insulin and free syringes should be made available in the primary health center level. Patients with complications need to buy specialized footwear and spectacles, which can be provided free of cost or at subsidized rates. The government can also provide low glycemic index foods as ration for the diabetes mellitus patients and can reduce the diet costs which are almost similar in both government and private facility. These changes not only help in reducing out-of-pocket expenditure for the patients but also help to improve the satisfaction of services at all the levels of health-care facility. They are useful especially for the patients who face disease progression such as cardiovascular disease, cataract, foot ulcer leading to amputation, and cost of rehabilitation due to disability.

## Conclusion

The current study found that almost three-fourths of the patients with diabetes mellitus are satisfied with the care received. Patients having complications and undergone hospitalization had lesser satisfaction with diabetes care services when compared to patients who did not have any complication or hospitalization. The cost of diabetes care

is more for patients seeking care from private sector than public sector. Further qualitative research can be done to explore the reasons for dissatisfaction among the patients and develop appropriate health financing strategies by interviewing the relevant stakeholders.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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### References

1. Kumpatla S, Kothandan H, Tharkar S, Vishwanathan V. The cost of treating long term diabetic complications in a developing country: a study from India. *J Assoc Physicians India*. 2013;61:102-9.
2. Gopichandran V. Public trust in vaccination: an analytical framework. *Indian J Med Ethics*. 2017;2:98-104.
3. McWilliams JM, Meara E, Zaslavsky AM, Ayanian JZ. Use of health services by previously uninsured Medicare beneficiaries. *New Eng J Med*. 2007;357:143-53.
4. Jacob R, Arnold LD, Hunleth J, Greiner KA, James AS. Daily hassles' role in health seeking behaviour among low-income populations. *Am J Health Behav*. 2014;38:297-306.
5. Gupta M, Singh R, Lehl SS. Diabetes in India: a long way to go. *Int J Sci Rep*. 2015;1:1-2.
6. Singh J. Economic burden of diabetes. *Diabetology*. 2013;45:205-8. Retrieved December 05, 2018, from: [http://www.apiindia.org/medicine\\_update\\_2013/chap45.pdf](http://www.apiindia.org/medicine_update_2013/chap45.pdf).
7. Hussain M, Naqvi SBS, Khan MA, Rizvi M, Alam S, Abbas A, Akram M. Direct cost of treatment of diabetes mellitus type 2 in Pakistan. *Int J Pharm Pharm Sci*. 2014;6:261-64.
8. Eaddy MT, Cook CL, O'Day K, Burch SP, Cantrell CR. How patient cost-sharing trends affect adherence and outcomes. *Pharm Therap*. 2012;37:45-55.
9. Akari S, Mateti UV, Kunduru BR. Health-care cost of diabetes in South India: a cost of illness study. *J Res Pharm Pract*. 2013;2:114-7.
10. Yesudian CAK, Grepstad M, Visintin E, A Ferrario. The economic burden of diabetes in India. *Global Health*. 2014;10:80.
11. Al-Aujan S, Al-Aqeel S, Al-Harbi A, Al-Abdullatif E. Patients' satisfaction with diabetes medications in one hospital, Saudi Arabia. *Pat Pref Adher*. 2012;6:735.
12. Pascal IG, Nkwa AA. Diabetes treatment satisfaction, medication adherence, and glycemic control among ambulatory type 2 diabetic Nigerians in a primary care clinic of a tertiary hospital situated in a resource limited environment of Southeast Nigeria. *Arch Med Health Sci*. 2016;4:169-74.
13. Doubova SV, Pérez-Cuevas R, Zepeda-Arias M, Flores-Hernández S. Satisfaction of patients suffering from type 2 diabetes and/or hypertension with care offered in family medicine clinics in Mexico. *Salud Publica Mex*. 2009;51:231-39.
14. Siham AB, Kamil MAS, Haiedr AAM, Sulaf IA, Siddik MAS. Satisfaction with diabetes services at primary care level, Khartoum state, Sudan. *Am J Health Res*. 2016;4:127-33.

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